

## **APPENDIX G**

### **MASS LOADING ANALYSIS**

## Appendix G

### Mass Loading Analysis for OU 2 and OU 3

The mass loading of arsenic, cadmium, lead and zinc was calculated to identify the potential source areas attributable to upstream sources, instream sources and influents along the Site. This analysis does not consider loads contributed from shallow groundwater adjacent to Silver Creek. Without hydraulic conductivity data from piezometers within either OU, only estimates of the potential mass load can be suggested where more obvious mass loads are not present. Total and dissolved metal mass loading was conducted. Zinc and cadmium were selected as they are the focus of the Silver Creek Total Maximum Daily Load (TMDL), approved by EPA in 2004. Arsenic and lead were selected based on their toxicity and potential impacts to surface water organisms or recreational receptors. The mass loading analysis is based on the first quarter data as it contains the most complete flow data.

The major source areas contributing to mass loading in Silver Creek are; Silver Maple Claims, tailings downstream of Highway 248 and the Big Four Mill area (Promontory Road). The Sniderville Basin Waste Water Treatment facility contributes loading for all four metals. Figures 1-2, 4-1 and Tables 4-1 through 4-3 provide a pictorial and tabular representation of the mass loading discussion. Figure 4-1 is demarcated with segments to portray the major load contribution areas for ease of reference.

Generally, mass loading increases in the Silver Maple Claims area of OU3 in a downstream progression for most metals (Segment 1, Figure 4-1). This mass load increase plateaus where Silver Creek passes under the US Highway 40 (US 40). The potential sources in this area are likely stream side tailings as there is very little groundwater present other than possibly deep groundwater discharging from the Thaynes Formation just upstream of the lower rail trail footbridge (SCURTFB). Between Highway 248 and US 40, mass loading decreases along the Floodplain tailings area (Segment 2) indicating that shallow alluvial deposits are not influencing surface water and possibly that most stream tailings have long been scoured out of the channel and deposited further downstream.

At the Silver Creek and State Road 248 junction water flows under the highway in two culverts SC248BC and SC248AC (Segment 3). The main Silver Creek flow mixes with flow from OU1 then proceeds under Hwy 248 via SC248BC. Mass loading significantly decreases at this point with effluent from OU1 that was remediated in 2012. Inflow from SWNGCF, the drainage north of the Geneva Concrete facility provides dilution to floodplain in this area. The decrease in loading is apparent until the dilution effects of OU1 and SWNGCF are no longer apparent at SC248NRB. Flow from SC248AC does not mix with the clean OU1 discharge and runs parallel on the opposite of the rail trail from the main Silver Creek flow finally mixing at location SC1C.

As Silver Creek flows move downstream from Segment 3 to Segment 4 (see Figure 4-1) there is a steady increase of mass loading starting at SCOU3BC shown on Figure 1-2 Sheet 2 of 4. From this point on downstream lies the majority of tailings and floodplain wetlands including the majority of exposed tailings adjacent to the stream that likely contribute loading where they are in contact with either the stream or shallow groundwater. It is in Segment 4 where the majority of tailings are present in the floodplain and where the Big Four Mill was located near the Promontory Road. Shallow groundwater affects at the upstream portion of Segment 4 are not apparent from current piezometer data (see Figure 1-3 and Table 2-6).

Of concern is the lack of surface water flow data and hence mass load data, particularly at the boundary between OU4 and OU3. Mass load analysis conducted by (Kimball, et.al., 2004) indicated substantial mass loading coming from the pipe draining Prospector Square. In this report the total loading of zinc between Park City and Wanship, Utah was about 49 kilograms per day. The Silver Maple Claims area (immediately downstream of OU4 for about  $\frac{1}{2}$  mile) contributed 38% of the zinc loading with the pipe draining Prospector Square contributing more than half the load at Silver Maple Claims. Substantial zinc loads also were added to Silver Creek downstream from the Silver Maple Claims area. Ground-water discharge upstream from the waste-water treatment plant contributed 20 percent of the total zinc load, and another 17 percent was contributed near the waste-water treatment plant. Current mass loading analyses does not demonstrate the same magnitude of load as calculated by Kimball. Certainly some of the discrepancy is due to methods used and flow regime differences in 2002 and 2015. As noted above, the first quarter of 2015 was the only quarter that year where most all surface water stations contained flow data.

## Attachments

**Figure 4-1 – 2015 First Quarter Daily Load for Silver Creek**

**Figure 4-1a – 2015 First Quarter Daily Load for Influent to Silver Creek**

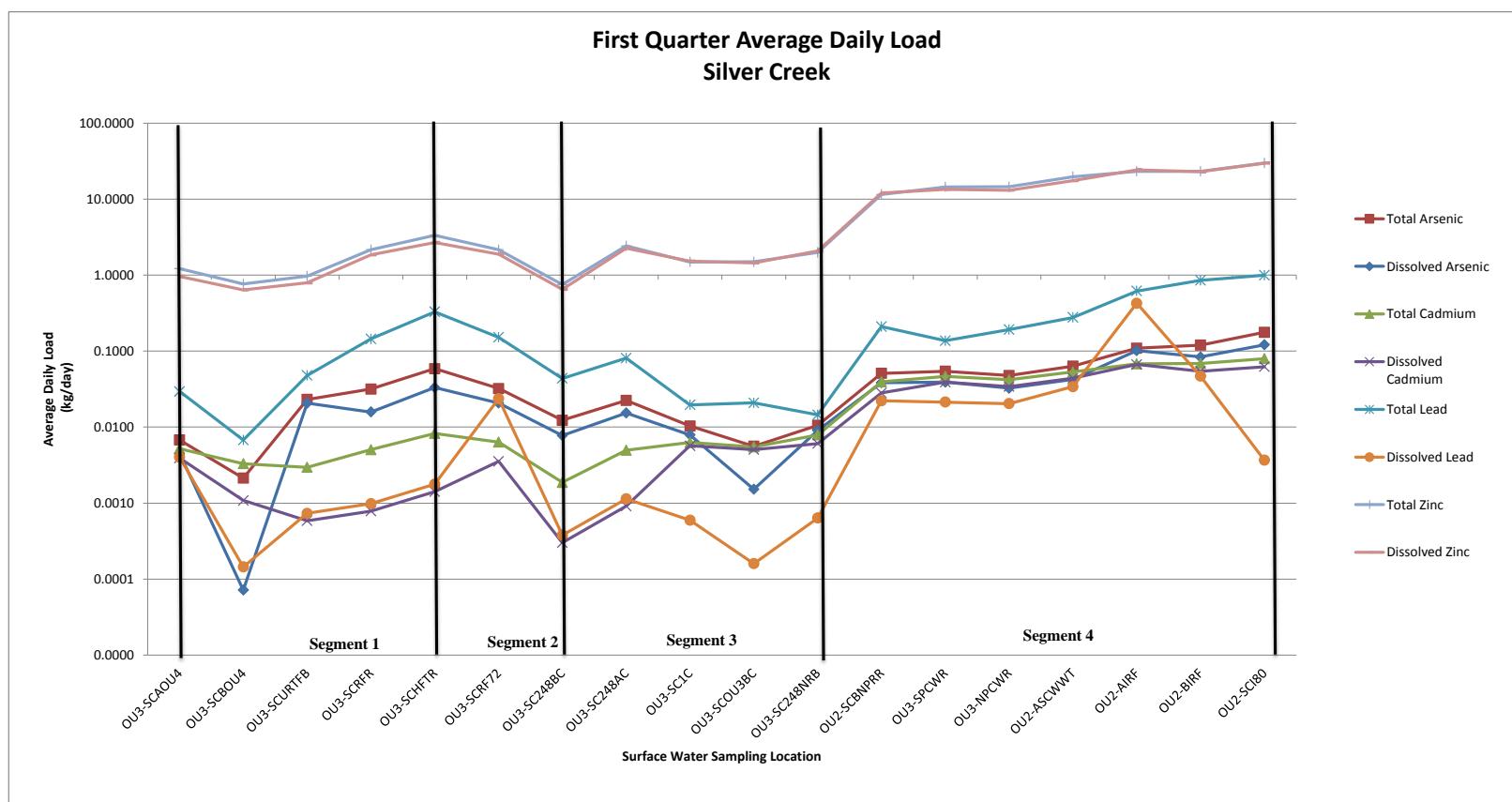
**Table 4-1 – Silver Creek Daily Load for Total Metals**

**Table 4-2 – Silver Creek Daily Load for Dissolved Metals**

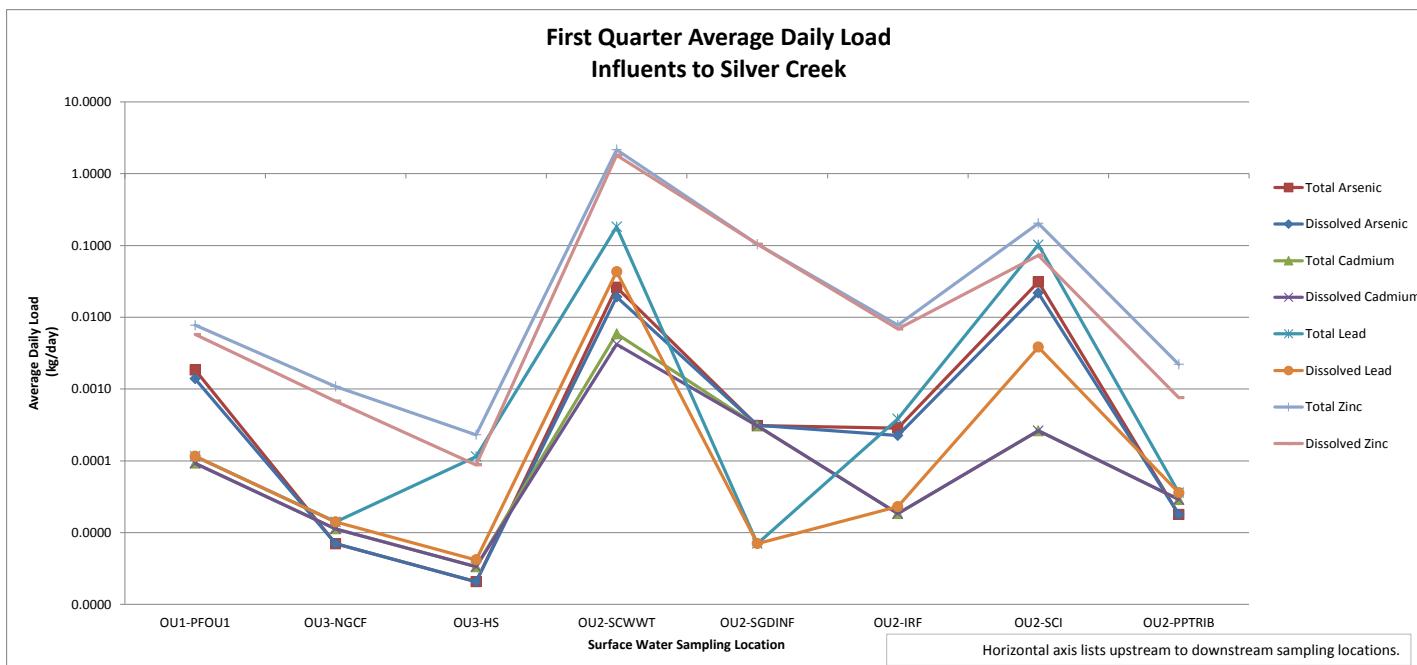
**Table 4-3 – Silver Creek Daily Load for Influent to Silver Creek**

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**FIGURE 4-1**  
 2015 First Quarter Daily Load for Silver Creek  
 Richardson Flat OU2 and OU3  
 Site Characterization Report



**FIGURE 4-1a**  
2015 First Quarter Daily Load for Influxes to Silver Creek  
Richardson Flat OU2 and OU3  
Site Characterization Report



**TABLE 4-1**  
Silver Creek Daily Load for Total Metals  
Richardson Flat OU2 and OU3  
Site Characterization Report

Location	Event	Date	Flow (gpm)	Total Arsenic		Total Cadmium		Total Lead		Total Zinc	
				Sample Result (mg/L)	Average Daily Load (kg/day)	Sample Result (mg/L)	Average Daily Load (kg/day)	Sample Result (mg/L)	Average Daily Load (kg/day)	Sample Result (mg/L)	Average Daily Load (kg/day)
OU3-SCAOU4	Q1	3/16/2015	325.29	0.00383	0.0068	0.00292	0.0052	0.0166	0.0294	0.688	1.218
	Q2	5/28/2015	NF	--	--	--	--	--	--	--	--
	Q3	9/2/2015	NF	--	--	--	--	--	--	--	--
	Q4	11/12/2014	NF	--	--	--	--	--	--	--	--
OU3-SCBOU4	Q1	3/16/2015	124.32	0.00315	0.0021	0.00488	0.0033	0.01	0.0068	1.13	0.765
	Q2	5/28/2015	NF	--	--	--	--	--	--	--	--
	Q3	9/2/2015	NF	--	--	--	--	--	--	--	--
	Q4	11/12/2014	NF	--	--	--	--	--	--	--	--
OU3-SCURTFB	Q1	3/13/2015	628.32	0.00676	0.0231	0.000863	0.0030	0.014	0.0479	0.283	0.968
	Q2	5/28/2015	NF	--	--	--	--	--	--	--	--
	Q3	9/2/2015	NF	--	--	--	--	--	--	--	--
	Q4	11/12/2014	NF	--	--	--	--	--	--	--	--
OU3-SCRFR	Q1	3/13/2015	843.74	0.00689	0.0316	0.0011	0.0051	0.0314	0.1442	0.469	2.154
	Q2	5/28/2015	508.04	0.00764	0.0211	0.00102	0.0028	0.0261	0.0722	0.237	0.655
	Q3	9/1/2015	NF	--	--	--	--	--	--	--	--
	Q4	11/12/2014	NF	--	--	--	--	--	--	--	--
OU3-SCHFTR	Q1	3/13/2015	1521.43	0.00708	0.0586	0.000997	0.0083	0.0396	0.3279	0.404	3.346
	Q2	5/28/2015	1400.26	0.00937	0.0714	0.000907	0.0069	0.0418	0.3186	0.232	1.768
	Q3	9/1/2015	NF	--	--	--	--	--	--	--	--
	Q4	10/9/2015	429.50	0.00834	0.0195	0.00068	0.0016	0.0371	0.0867	0.232	0.542
OU3-SCRF72	Q1	3/13/2015	897.60	0.00658	0.0321	0.0013	0.0064	0.0311	0.1519	0.441	2.155
	Q2	5/28/2015	1222.98	0.00907	0.0604	0.00136	0.0091	0.044	0.2929	0.308	2.050
	Q3	9/1/2015	NF	--	--	--	--	--	--	--	--
	Q4	10/9/2015	482.91	0.00789	0.0207	0.000761	0.0020	0.0351	0.0923	0.234	0.615
OU3-SC248BC	Q1	3/13/2015	324.03	0.00698	0.0123	0.00106	0.0019	0.0248	0.0437	0.427	0.753
	Q2	5/28/2015	1952.28	0.00772	0.0820	0.00119	0.0126	0.0292	0.3103	0.294	3.124
	Q3	9/1/2015	426.36	0.0158	0.0367	0.00127	0.0029	0.101	0.2344	0.278	0.645
	Q4	10/9/2015	695.64	0.00848	0.0321	0.000631	0.0024	0.038	0.1439	0.212	0.803
OU3-SC248AC	Q1	3/13/2015	978.38	0.00422	0.0225	0.000929	0.0049	0.0152	0.0809	0.454	2.418
	Q2	5/28/2015	250.43	0.00872	0.0119	0.00124	0.0017	0.0317	0.0432	0.412	0.562
	Q3	9/1/2015	NF	--	--	--	--	--	--	--	--
	Q4	10/9/2015	NF	--	--	--	--	--	--	--	--
OU3-SC1C	Q1	3/11/2015	509.87	0.00372	0.0103	0.00226	0.0063	0.00707	0.0196	0.537	1.490
	Q2	5/27/2015	NF	--	--	--	--	--	--	--	--
	Q3	9/1/2015	178.62	0.0138	0.0134	0.000586	0.0006	0.0612	0.0595	0.143	0.139
	Q4	10/8/2015	451.94	0.00953	0.0234	0.000682	0.0017	0.0369	0.0908	0.166	0.408
OU3-SCOU3BC	Q1	3/11/2015	137.33	0.00749	0.0056	0.00732	0.0055	0.0278	0.0208	2	1.495
	Q2	5/27/2015	NF	--	--	--	--	--	--	--	--
	Q3	9/1/2015	NF	--	--	--	--	--	--	--	--
	Q4	10/8/2015	NF	--	--	--	--	--	--	--	--
OU3-SC248NRB	Q1	3/11/2015	547.54	0.00354	0.0106	0.00265	0.0079	0.00485	0.0145	0.667	1.988
	Q2	5/27/2015	116.69	0.0043	0.0027	0.00223	0.0014	0.00596	0.0038	0.636	0.404
	Q3	9/1/2015	NF	--	--	--	--	--	--	--	--
	Q4	10/8/2015	327.18	0.00814	0.0145	0.00283	0.0050	0.00528	0.0094	1.15	2.048
OU2-SCBNPWR	Q1	3/11/2015	1651.58	0.00568	0.0511	0.00439	0.0395	0.0233	0.2095	1.28	11.507
	Q2	5/27/2015	3208.92	0.00669	0.1169	0.00281	0.0491	0.0106	0.1851	0.703	12.279
	Q3	9/1/2015	NF	--	--	--	--	--	--	--	--
	Q4	10/8/2015	327.18	0.01	0.0178	0.00105	0.0019	0.0133	0.0237	0.711	1.266
OU3-SPCWR	Q1	3/10/2015	1822.13	0.00548	0.0544	0.00467	0.0463	0.0138	0.1369	1.46	14.481
	Q2	5/27/2015	1741.34	0.00591	0.0560	0.00382	0.0362	0.00553	0.0524	0.957	9.071
	Q3	8/31/2015	178.17	0.0179	0.0174	0.000581	0.0006	0.0253	0.0245	0.159	0.154
	Q4	10/8/2015	273.77	0.0102	0.0152	0.00124	0.0018	0.0123	0.0183	0.797	1.188
OU3-NPCWR	Q1	3/10/2015	1439.75	0.00609	0.0477	0.00534	0.0418	0.0245	0.1920	1.85	14.498
	Q2	5/27/2015	4878.45	0.00645	0.1713	0.00606	0.1609	0.00798	0.2119	1.52	40.363
	Q3	8/31/2015	129.70	0.0202	0.0143	0.000559	0.0004	0.0272	0.0192	0.238	0.168
	Q4	10/8/2015	501.31	0.0135	0.0368	0.00119	0.0032	0.0264	0.0720	0.711	1.940
OU2-ASCWWT	Q1	3/10/2015	1790.71	0.00651	0.0635	0.00544	0.0530	0.0284	0.2768	2.02	19.689
	Q2	5/26/2015	NF	--	--	--	--	--	--	--	--
	Q3	8/31/2015	NF	--	--	--	--	--	--	--	--
	Q4	10/8/2015	NF	--	--	--	--	--	--	--	--
OU2-AIRF	Q1	3/9/2015	2953.10	0.00677	0.1088	0.00423	0.0680	0.0384	0.6173	1.44	23.147
	Q2	5/26/2015	4689.96	0.00811	0.2070	0.00396	0.1011	0.0421	1.0747	1.05	26.805
	Q3	8/31/2015	NF	--	--	--	--	--	--	--	--
	Q4	10/8/2015	NF	--	--	--	--	--	--	--	--
OU2-BIRF	Q1	3/9/2015	2975.54	0.00741	0.1200	0.00423	0.0685	0.0527	0.8536	1.43	23.161
	Q2	5/26/2015	3944.95	0.00823	0.1767	0.00453	0.0973	0.0587	1.2605	1.18	25.338
	Q3	8/31/2015	1051.54	0.0134	0.0767	0.000171	0.0010	0.0387	0.2215	0.199	1.139
	Q4	10/8/2015	1609.40	0.0207	0.1813	0.00123	0.0108	0.0755	0.6614	0.596	5.221
OU2-SCI80	Q1	3/9/2015	3150.58	0.0103	0.1766	0.00464	0.0796	0.0579	0.9929	1.74	29.840
	Q2	5/26/2015	4625.33	0.0101	0.2543	0.00445	0.1120	0.0509	1.2815	1.28	32.226
	Q3	8/31/2015	929.02	0.0212	0.1072	0.000593	0.0030	0.0336	0.1699	0.324	1.638
	Q4	10/8/2015	872.02	0.0251	0.1191	0.00103	0.0049	0.0552	0.2620	0.583	2.767

**Notes:**

Flow measurements were collected quarterly from November 2014 to October 2015  
Q1 field water quality measurements were collected in March 2015 by RMC.

Q2 field water quality measurements were collected in May 2015 by UPCM.

Q3 field water quality measurements were collected in August and September 2015 by UPCM.

Q4 field water quality measurements were collected in November 2014 by RMC or in October 2015 by UPCM.

See Figure 1-2 for sampling locations.

Locations where duplicate sample collected, highest concentration used for mass loading analysis

One half of detection limit used to calculate mass loading when metals concentration was non-detect. Concentration and Mass loading is noted through italics.

Average Daily Mass Loading = flow rate (gpm) \* sample result (mg/L) \* 3.78 L/gal \* 0.001 g/mg \* 60 min/hr \* 24 hr/day \* 0.001 kg/g

**Key:**

kg/day = kilograms per day

gpm= Gallons Per Minute

mg/L = milligrams per liter

NC = Not Collected; See Section 2.6 for details

NF= No Flow Measurement Collected

OU1 = Richardson Flat Tailings Site Operable Unit 1

OU2 = Richardson Flat Tailings Site Operable Unit 2

OU3 = Richardson Flat Tailings Site Operable Unit 3

Q1 = First Quarter

Q2 = Second Quarter

Q3 = Third Quarter

Q4 = Fourth Quarter

-- = Metals Concentration not shown; no flow was present

**TABLE 4-2**  
 Silver Creek Daily Load for Dissolved Metals  
 Richardson Flat OU2 and OU3  
 Site Characterization Report

Location	Event	Date	Flow (gpm)	Dissolved Arsenic		Dissolved Cadmium		Dissolved Lead		Dissolved Zinc	
				Sample Result (mg/L)	Average Daily Load (kg/day)	Sample Result (mg/L)	Average Daily Load (kg/day)	Sample Result (mg/L)	Average Daily Load (kg/day)	Sample Result (mg/L)	Average Daily Load (kg/day)
OU3-SCAOU4	Q1	3/16/2015	325.29	0.00253	0.0045	0.00221	0.0039	0.0028	0.0040	0.544	0.9632
	Q2	5/28/2015	NF	--	--	--	--	--	--	--	--
	Q3	9/2/2015	NF	--	--	--	--	--	--	--	--
	Q4	11/12/2014	NF	--	--	--	--	--	--	--	--
OU3-SCBOU4	Q1	3/16/2015	124.32	<i>0.000106</i>	<i>0.0001</i>	0.0016	0.0011	<i>0.000214</i>	<i>0.0001</i>	0.945	0.6395
	Q2	5/28/2015	NF	--	--	--	--	--	--	--	--
	Q3	9/2/2015	NF	--	--	--	--	--	--	--	--
	Q4	11/12/2014	NF	--	--	--	--	--	--	--	--
OU3-SCURTFB	Q1	3/13/2015	628.32	0.00603	0.0206	<i>0.000171</i>	0.0006	<i>0.000214</i>	0.0007	0.231	0.7900
	Q2	5/28/2015	NF	--	--	--	--	--	--	--	--
	Q3	9/2/2015	NF	--	--	--	--	--	--	--	--
	Q4	11/12/2014	NF	--	--	--	--	--	--	--	--
OU3-SCRFR	Q1	3/13/2015	843.74	0.00344	0.0158	<i>0.000171</i>	0.0008	<i>0.000214</i>	<i>0.0010</i>	0.402	1.8463
	Q2	5/28/2015	508.04	0.00537	0.0149	<i>0.000171</i>	0.0005	<i>0.000214</i>	0.0006	0.165	0.4563
	Q3	9/1/2015	NF	--	--	--	--	--	--	--	--
	Q4	11/12/2014	NF	--	--	--	--	--	--	--	--
OU3-SCHFTR	Q1	3/13/2015	1521.43	0.004	0.0331	<i>0.000171</i>	0.0014	<i>0.000214</i>	0.0018	0.323	2.6749
	Q2	5/28/2015	1400.26	0.00623	0.0475	<i>0.000171</i>	0.0013	0.00207	0.0158	0.162	1.2347
	Q3	9/1/2015	NF	--	--	--	--	--	--	--	--
	Q4	10/9/2015	429.50	0.00649	0.0152	<i>0.000171</i>	0.0004	0.00532	0.0124	0.214	0.5003
OU3-SCRF72	Q1	3/13/2015	897.60	0.00425	0.0208	<i>0.000726</i>	0.0035	0.00483	0.0236	0.386	1.8859
	Q2	5/28/2015	1222.98	0.00596	0.0397	<i>0.000171</i>	0.0011	<i>0.000214</i>	0.0014	0.228	1.5178
	Q3	9/1/2015	NF	--	--	--	--	--	--	--	--
	Q4	10/9/2015	482.91	0.00638	0.0168	0.000501	0.0013	0.0154	0.0405	0.223	0.5862
OU3-SC248BC	Q1	3/13/2015	324.03	0.0044	0.0078	<i>0.000171</i>	0.0003	<i>0.000214</i>	0.0004	0.367	0.6473
	Q2	5/28/2015	1952.28	0.00534	0.0567	<i>0.000171</i>	<i>0.0018</i>	<i>0.000214</i>	0.0023	0.236	2.5079
	Q3	9/1/2015	426.36	0.00988	0.0229	<i>0.000171</i>	0.0004	0.002	0.0046	0.0874	0.2028
	Q4	10/9/2015	695.64	0.00575	0.0218	<i>0.000171</i>	0.0006	0.0045	0.0170	0.174	0.6589
OU3-SC248AC	Q1	3/13/2015	978.38	0.00288	0.0153	<i>0.000171</i>	0.0009	<i>0.000214</i>	<i>0.0011</i>	0.425	2.2634
	Q2	5/28/2015	250.43	0.00523	0.0071	<i>0.000171</i>	0.0002	<i>0.000214</i>	0.0003	0.309	0.4212
	Q3	9/1/2015	NF	--	--	--	--	--	--	--	--
	Q4	10/9/2015	NF	--	--	--	--	--	--	--	--
OU3-SC1C	Q1	3/11/2015	509.87	0.00284	0.0079	0.00204	0.0057	<i>0.000214</i>	0.0006	0.549	1.5237
	Q2	5/27/2015	NF	--	--	--	--	--	--	--	--
	Q3	9/1/2015	178.62	0.00933	0.0091	<i>0.000171</i>	0.0002	0.00301	0.0029	0.0538	0.0523
	Q4	10/8/2015	451.94	0.00676	0.0166	<i>0.000171</i>	0.0004	0.00388	0.0095	0.105	0.2583
OU3-SCOU3BC	Q1	3/11/2015	137.33	0.00204	0.0015	0.00676	0.0051	<i>0.000214</i>	0.0002	1.93	1.4427
	Q2	5/27/2015	NF	--	--	--	--	--	--	--	--
	Q3	9/1/2015	NF	--	--	--	--	--	--	--	--
	Q4	10/8/2015	NF	--	--	--	--	--	--	--	--
OU3-SC248NRB	Q1	3/11/2015	547.54	0.00304	0.0091	0.00204	0.0061	<i>0.000214</i>	0.0006	0.697	2.0773
	Q2	5/27/2015	116.69	0.00414	0.0026	0.00142	0.0009	0.00228	0.0014	0.654	0.4154
	Q3	9/1/2015	NF	--	--	--	--	--	--	--	--
	Q4	10/8/2015	327.18	0.00801	0.0143	0.00272	0.0048	0.00304	0.0054	1.11	1.9768
OU2-SCBNPWR	Q1	3/11/2015	1651.58	0.00427	0.0384	0.00313	0.0281	0.00247	0.0222	1.34	12.0465
	Q2	5/27/2015	3208.92	0.00513	0.0896	0.00151	0.0264	<i>0.000214</i>	0.0037	0.689	12.0346
	Q3	9/1/2015	NF	--	--	--	--	--	--	--	--
	Q4	10/8/2015	327.18	0.00914	0.0163	0.000809	0.0014	0.0068	0.0121	0.672	1.1968
OU3-SPCWWR	Q1	3/10/2015	1822.13	0.00394	0.0391	0.00394	0.0391	0.00215	0.0213	1.35	13.3896
	Q2	5/27/2015	1741.34	0.00502	0.0476	0.00203	0.0192	<i>0.000214</i>	0.0020	0.928	8.7960
	Q3	8/31/2015	178.17	0.0153	0.0148	<i>0.000171</i>	0.0002	0.00399	0.0039	0.137	0.1329
	Q4	10/8/2015	273.77	0.00828	0.0123	0.00061	0.0009	0.00281	0.0042	0.732	1.0908
OU3-NPCWR	Q1	3/10/2015	1439.75	0.00414	0.0324	0.00437	0.0342	0.0026	0.0204	1.67	13.0875
	Q2	5/27/2015	4878.45	0.00494	0.1312	0.00375	0.0996	<i>0.000214</i>	0.0057	1.47	39.0349
	Q3	8/31/2015	129.70	0.0173	0.0122	<i>0.000171</i>	0.0001	0.00419	0.0030	0.202	0.1426
	Q4	10/8/2015	501.31	0.0104	0.0284	0.000549	0.0015	0.00543	0.0148	0.638	1.7409
OU2-ASCWWT	Q1	3/10/2015	1790.71	0.00435	0.0424	0.0045	0.0439	0.00349	0.0340	1.79	17.4475
	Q2	5/26/2015	NF	--	--	--	--	--	--	--	--
	Q3	8/31/2015	NF	--	--	--	--	--	--	--	--
	Q4	10/8/2015	NF	--	--	--	--	--	--	--	--
OU2-AIRF	Q1	3/9/2015	2953.10	0.00629	0.1011	0.00414	0.0665	0.0265	0.4260	1.51	24.2722
	Q2	5/26/2015	4689.96	0.00638	0.1629	0.00225	0.0574	0.00351	0.0896	0.88	22.4650
	Q3	8/31/2015	NF	--	--	--	--	--	--	--	--
	Q4	10/8/2015	NF	--	--	--	--	--	--	--	--
OU2-BIRF	Q1	3/9/2015	2975.54	0.00516	0.0836	0.00335	0.0543	0.0029	0.0470	1.41	22.8370
	Q2	5/26/2015	3944.95	0.00594	0.1276	0.00224	0.0481	0.00295	0.0633	0.972	20.8719
	Q3	8/31/2015	1051.54	0.0127	0.0727	<i>0.000171</i>	<i>0.0010</i>	0.00902	0.0516	0.168	0.9616
	Q4	10/8/2015	1609.40	0.0162	0.1419	0.000613	0.0054	0.00472	0.0413	0.461	4.0385
OU2-SCI80	Q1	3/9/2015	3150.58	0.00706	0.1211	0.00363	0.0623	<i>0.000214</i>	<i>0.0037</i>	1.73	29.6681
	Q2	5/26/2015	4625.33	0.00819	0.2062	0.00287	0.0723	0.00992	0.2498	1.12	28.1978
	Q3	8/31/2015	929.02	0.0198	0.1001	<i>0.000171</i>	0.0009	0.00607	0.0307	0.297	1.5019
	Q4	10/8/2015	872.02	0.0222	0.1054	0.000696	0.0033	0.0157	0.0745	0.513	2.4350

**Notes:**

Flow measurements were collected quarterly from November 2014 to October 2015

Q1 field water quality measurements were collected in March 2015 by RMC.

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See Figure 1-2 for sampling locations.

Locations where duplicate sample collected, highest concentration used for mass loading analysis

One half of detection limit used to calculate mass loading when metals concentration was non-detect. Concentration and Mass loading is noted through italics.

Average Daily Mass Loading = flow rate (gpm) \* sample result (mg/L) \* 3.78 L/gal \* 0.001 g/mg \* 60 min/hr \* 24 hr/day \* 0.001 kg/g

**Key:**

kg/day = kilograms per day

gpm= Gallons Per Minute

mg/L = milligrams per liter

NC = Not Collected; See Section 2.6 for details

NF= No Flow Measurement Collected

OU1 = Richardson Flat Tailings Site Operable Unit 1

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**TABLE 4-3**  
**Silver Creek Daily Load for Influentes to Silver Creek**  
**Richardson Flat OU2 and OU3**  
**Site Characterization Report**

**TABLE 4-3**  
 Silver Creek Daily Load for Influxes to Silver Creek  
 Richardson Flat OU2 and OU3  
 Site Characterization Report

Location	Event	Date	Flow	Dissolved Arsenic		Dissolved Cadmium		Dissolved Lead		Dissolved Zinc	
				Sample Result (mg/L)	Average Daily Load (kg/day)	Sample Result (mg/L)	Average Daily Load (kg/day)	Sample Result (mg/L)	Average Daily Load (kg/day)	Sample Result (mg/L)	Average Daily Load (kg/day)
OU1-PFOU1	Q1	3/13/2015	99.63	0.00257	0.0014	<i>0.000171</i>	<i>0.0001</i>	<i>0.000214</i>	<i>0.0001</i>	0.0106	0.006
	Q2	5/28/2015	NF	--	--	--	--	--	--	--	--
	Q3	9/1/2015	NF	--	--	--	--	--	--	--	--
	Q4	10/9/2015	NF	--	--	--	--	--	--	--	--
OU3-NGCF	Q1	3/11/2015	12.12	<i>0.000106</i>	<i>0.000007</i>	<i>0.000171</i>	<i>0.000011</i>	<i>0.000214</i>	<i>0.00001</i>	0.0103	0.001
	Q2	X	NF	--	--	--	--	--	--	--	--
	Q3	X	NF	--	--	--	--	--	--	--	--
	Q4	X	NF	--	--	--	--	--	--	--	--
OU3-HS	Q1	3/11/2015	3.59	<i>0.000106</i>	<i>0.000002</i>	<i>0.000171</i>	<i>0.000003</i>	<i>0.000214</i>	<i>0.000004</i>	0.0045	<i>0.0001</i>
	Q2	X	NF	--	--	--	--	--	--	--	--
	Q3	X	NF	--	--	--	--	--	--	--	--
	Q4	X	NF	--	--	--	--	--	--	--	--
OU2-SCWWT	Q1	3/10/2015	1252.15	0.00281	0.0192	0.000619	0.0042	0.00633	0.0431	0.265	1.806
	Q2	5/26/2015	807.84	<i>0.00337</i>	0.0148	<i>0.000863</i>	0.0038	0.00246	0.0108	0.299	1.315
	Q3	8/31/2015	1112.00	0.00418	0.0253	<i>0.000171</i>	<i>0.0010</i>	0.00479	0.0290	0.0689	0.417
	Q4	10/8/2015	780.91	0.00407	0.0173	<i>0.000171</i>	<i>0.0007</i>	0.00412	0.0175	0.0989	0.420
OU2-SGDINF	Q1	3/19/2015	6.06	0.00946	0.0003	0.00927	0.0003	<i>0.000214</i>	<i>0.00001</i>	3.15	0.104
	Q2	X	NF	--	--	--	--	--	--	--	--
	Q3	X	NF	--	--	--	--	--	--	--	--
	Q4	X	NF	--	--	--	--	--	--	--	--
OU2-IRF	Q1	3/9/2015	19.74	0.0021	0.0002	<i>0.000171</i>	<i>0.00002</i>	<i>0.000214</i>	<i>0.00002</i>	0.0638	0.007
	Q2	5/26/2015	NF	--	--	--	--	--	--	--	--
	Q3	8/31/2015	NF	--	--	--	--	--	--	--	--
	Q4	10/8/2015	NF	--	--	--	--	--	--	--	--
OU2-SCI	Q1	3/9/2015	281.40	0.0142	0.0218	<i>0.000171</i>	<i>0.0003</i>	0.00251	0.0038	0.0478	0.073
	Q2	5/26/2015	1262.03	0.0116	0.0797	<i>0.000171</i>	<i>0.0012</i>	0.00372	0.0256	0.0411	0.282
	Q3	8/31/2015	355.45	0.0126	0.0244	<i>0.000171</i>	<i>0.0003</i>	0.00455	0.0088	0.065	0.126
	Q4	10/8/2015	262.10	0.0164	0.0234	<i>0.000171</i>	<i>0.0002</i>	0.000214	0.0003	0.0381	0.054
OU2-PPTRIB	Q1	3/19/2015	30.97	<i>0.000106</i>	<i>0.000018</i>	<i>0.000171</i>	<i>0.000029</i>	<i>0.000214</i>	<i>0.000036</i>	0.0045	<i>0.001</i>
	Q2	X	NF	--	--	--	--	--	--	--	--
	Q3	X	NF	--	--	--	--	--	--	--	--
	Q4	X	NF	--	--	--	--	--	--	--	--

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